

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

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1. CANCEL
 2. (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[1]] 4, wherein the upper layer has a thickness of at least 4 Å.
 3. (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[1]] 4, wherein the upper layer has a thickness of less than 5 Å.
 4. (CURRENTLY AMENDED) A spin valve (SV) sensor, comprising:
 - a pinned layer having a pinned layer magnetization;
 - a free layer disposed towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
 - a pinning layer disposed towards the pinned layer for fixing the pinned layer magnetization;
 - an underlayer disposed towards the pinning layer, the underlayer comprising NiFeX; and
 - an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising at least one material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;wherein the sensor provides an increase of $\Delta R/R$ of at least 5% when compared to an otherwise identical sensor not having the upper layer;

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1. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:
 - a pinned layer having a pinned layer magnetization;
 - a free layer disposed towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
 - a pinning layer disposed towards the pinned layer for fixing the pinned layer magnetization;
 - an underlayer disposed towards the pinning layer, the underlayer comprising NiFeX; and
 - an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising at least one material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;
 - ~~wherein the sensor provides an increase of $\Delta R/R$ of at least 5% when compared to an otherwise identical sensor not having the upper layer~~
 - wherein the upper layer is doped for at least one of reducing an electrical conductivity of the upper layer and reducing magnetic properties of the upper layer.
 2. (PREVIOUSLY PRESENTED) The spin valve sensor as recited in claim 1, wherein the upper layer has a thickness of at least 4 Å.
 3. (PREVIOUSLY PRESENTED) The spin valve sensor as recited in claim 1, wherein the upper layer has a thickness of less than 5 Å.

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